Operating instructions

POWER CUTTING MILL

PULVERISETTE 25

Valid starting with: 25.20XX/0100

Read the instructions prior to performing any task!

Translation of the original operating instructions

Fritsch GmbH
Milling and Sizing
Industriestraße 8
D - 55743 Idar-Oberstein
Telephone: +49 (0)6784/ 70-0
Fax: +49 (0)6784/ 70-11
Email: info@fritsch.de
Internet: www.fritsch.de

Certifications and CE conformity

Certification

Fritsch GmbH has been certified by the TÜV-Zertifizierungsgemeinschaft e.V.

TGA-ZM-05-08-00

An audit certified that Fritsch GmbH conforms to the requirements of the DIN EN ISO 9001:2008.

CE Conformity

The enclosed Conformity Declaration lists the guidelines the FRITSCH instrument conforms to, to be able to bear the CE mark.

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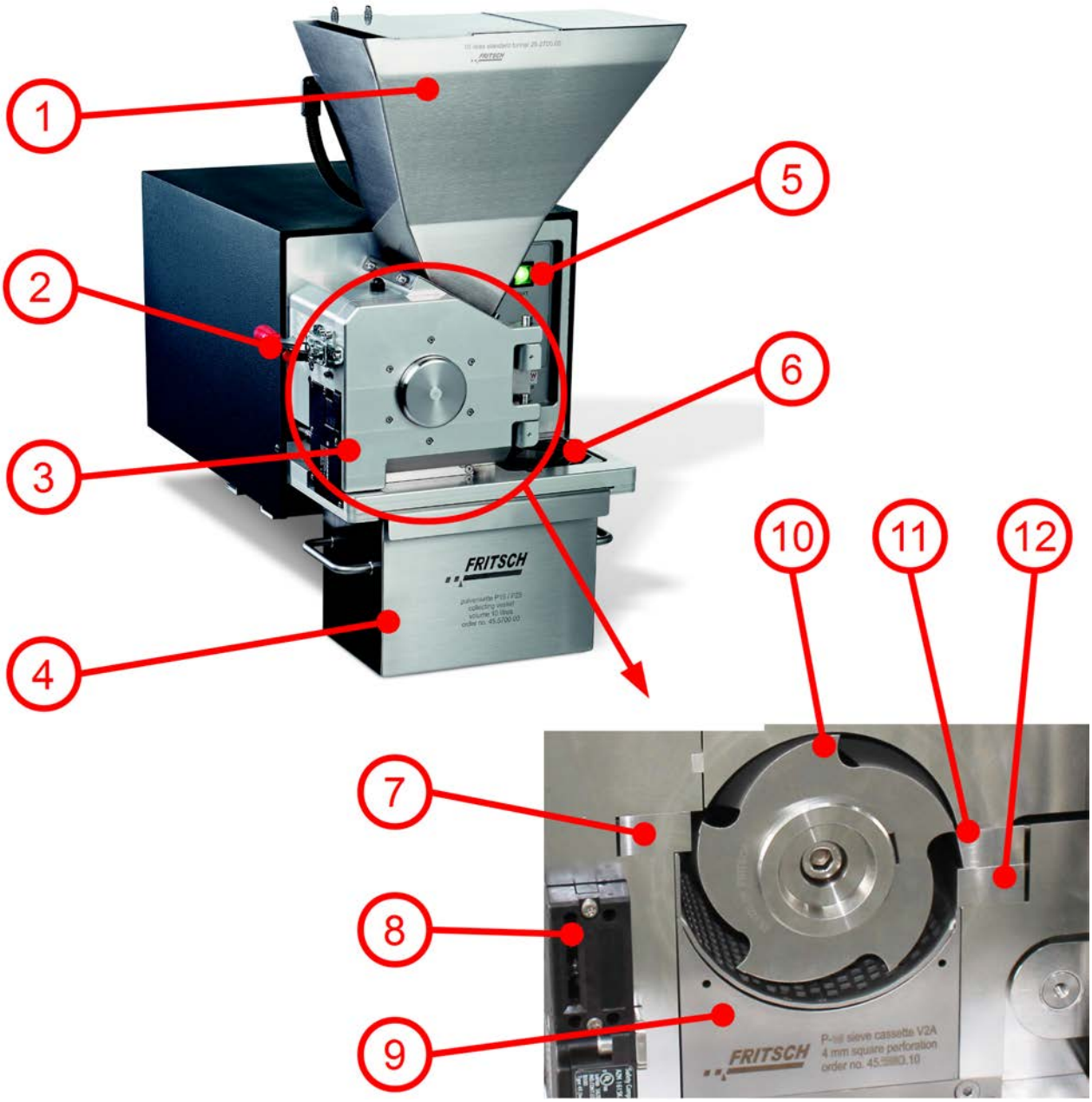
1 Basic structure



1 Standard funnel
2 Latch clamp
3 Closing lid
4 Collecting vessel
5 Control panel
6 Air filter
7 Fixed knife 3
8 Safety switch
9 Sieve cassette
10 Rotor
11 Fixed knife 1
12 Fixed knife 2

2 Safety information and use

2.1 Requirements for the user

This operating manual is intended for persons assigned with operating and monitoring the Fritsch PULVERISETTE 25. The operating manual and especially its safety instructions are to be observed by all persons working on or with this device. In addition, the applicable rules and regulations for accident prevention at the installation site are to be observed. Always keep the operating manual at the installation site of the PULVERISETTE 25.

People with health problems or under the influence of medication, drugs, alcohol or exhaustion must not operate this device.

The PULVERISETTE 25 may only be operated by authorised persons and serviced or repaired by trained specialists. All commissioning, maintenance and repair work may only be carried out by technically qualified personnel. Qualified personnel are persons who, because of their education, experience and training as well as their knowledge of relevant standards, regulations, accident prevention guidelines and operating conditions, are authorised by those responsible for the safety of the machine to carry out the required work and are able to recognize and avoid possible hazards as defined for skilled workers in IEC 364.

In order to prevent hazards to users, follow the instructions in this manual.

Malfunctions that impair the safety of persons, the PULVERISETTE 25 or other material property must be rectified immediately. The following information serves both the personal safety of operating personnel as well as the safety of the products described and any devices connected to them: All maintenance and repair work may only be performed by technically qualified personnel.

This operating manual is not a complete technical description. Only the details required for operation and maintaining usability are described.

Fritsch has prepared and reviewed this operating manual with the greatest care. However, no guarantee is made for its completeness or accuracy.

Subject to technical modifications.

2.2 Scope of application

The Power - cutting mill PULVERISETTE 25 can be used for the fast comminution of medium-hard, brittle, tough and fibrous materials like:

Sheet rubber, plastics, metal-free refuse, dry meat, leather, wood, coal, malt, paper/cardboard, peat, animal feed, pasta, tablets, leaves, pellets, spices, mesh wire, straw, maize, bones

2.2.1 Operating principle

The material to be cut is moved in front of a plunger and fed into the cutting chamber by means of a funnel. There, rotating knives in combination with three fixed knives cut the sample material. The cutting chamber is closed at the bottom by a sieve cassette. Comminuted material is gathered in a collecting vessel after it passes the sieve cassette.

2.2.2 Drive motor

A three-phase motor without mechanical brake serves as the drive.

2.3 Obligations of the operator

Before using the PULVERISETTE 25, this manual is to be carefully read and understood. The use of the PULVERISETTE 25 requires technical knowledge; only commercial use is permitted.

The operating personnel must be familiar with the content of the operating manual. For this reason, it is very important that these persons actually receive the present operating manual. Ensure that the operating manual is always near the device.

The PULVERISETTE 25 may exclusively be used within the scope of applications set down in this manual and within the framework of guidelines put forth in this manual. In case of non-compliance or improper use, the customer assumes full liability for the functional capability of the PULVERISETTE 25 and for any damage or injury arising from failure to fulfil this obligation.

By using the PULVERISETTE 25 the customer agrees with this and recognizes that defects, malfunctions or errors cannot be completely excluded. To prevent risk of damage to persons or property or of other direct or indirect damage, resulting from this or other causes, the customer must implement sufficient and comprehensive safety measures for working with the PULVERISETTE 25.

Neither compliance with this manual nor the conditions and methods used during installation, operation, use and maintenance of the PULVERISETTE 25 can be monitored by Fritsch GmbH. Improper execution of the installation can result in property damage and thus endanger persons. Therefore, we assume absolutely no responsibility or liability for loss, damage or costs that result from errors at installation, improper operation or improper use or improper maintenance or are in any way connected to these.

The applicable accident prevention guidelines must be complied with.

Generally applicable legal and other obligatory regulations regarding environmental protection must be observed.

2.4 Information on hazards and symbols used in this manual

Safety information

Safety information in this manual is designated by symbols. Safety information is introduced by keywords that express the extent of the hazard.

DANGER!
This symbol and keyword combination points out a directly hazardous situation that can result in death or serious injury if not avoided.

WARNING!
This symbol and keyword combination points out a possibly hazardous situation that can result in death or serious injury if not avoided.

CAUTION!
This symbol and keyword combination points out a possibly hazardous situation that can result in slight or minor injury if not avoided.

NOTICE!
This symbol and keyword combination points out a possibly hazardous situation that can result in property damage if not avoided.

ENVIRONMENT!
This symbol and keyword combination points out a possibly hazardous situation that can result in environmental damage if not avoided.

Special safety information

To call attention to specific hazards, the following symbols are used in the safety information:

DANGER!
This symbol and keyword combination points out a directly hazardous situation due to electrical current. Ignoring information with this designation will result in serious or fatal injury.

DANGER!

This symbol and keyword combination designates contents and instructions for proper use of the machine in explosive areas or with explosive substances. Ignoring information with this designation will result in serious or fatal injury.

DANGER!

This symbol and keyword combination designates contents and instructions for proper use of the machine with combustible substances. Ignoring information with this designation will result in serious or fatal injury.

WARNING!

This symbol and keyword combination points out a directly hazardous situation due to movable parts. Ignoring information with this designation can result in hand injuries.

WARNING!

This symbol and keyword combination points out a directly hazardous situation due to hot surfaces. Ignoring information with this designation can result in serious burn injuries due to skin contact with hot surfaces.

Safety information in the procedure instructions

Safety information can refer to specific, individual procedure instructions. Such safety information is embedded in the procedure instructions so that the text can be read without interruption as the procedure is being carried out. The keywords described above are used.

Example:

1. Loosen screw.
2.

   CAUTION!

   Risk of entrapment at the lid.

   Close the lid carefully.
3. Tighten screw.

Tips and recommendations

This symbol emphasises useful tips and recommendations as wells as information for efficient operation without malfunction.

Further designations

To emphasise procedure instructions, results, lists, references and other elements, the following designations are used in this manual:

Designation	Explanation
1., 2., 3. ...	Step-by-step procedure instructions
⇨	Results of steps in the procedure
	References to sections in this manual and relevant documentation
■	Lists without a specific order
[Button]	Operating elements (e.g. push button, switch), display elements (e.g. signal lamps)
'Display'	Screen elements (e.g. buttons, function key assignment)

2.5 Device safety information

Please observe!

- Only use original accessories and original spare parts. Failure to observe this instruction can compromise the safety of the machine.
- Accident-proof conduct is to be strictly followed during all work.
- Comply with all currently applicable national and international accident prevention guidelines.

CAUTION!

Wear hearing protection!

If a noise level of 85 dB(A) is reached or exceeded, ear protection should be worn to prevent hearing damage.

WARNING!

The maximum accepted concentration (MAC) levels of the relevant safety guidelines must be observed; if necessary, ventilation must be provided or the machine must be operated under an extractor hood.

Safety information and use

DANGER!

Explosion hazard!

– When Cutting oxidizable substances, e.g. metals or coal, there is a risk of spontaneous combustion (dust explosion) if the share of fine particles exceeds a certain percentage. When Cutting these kinds of substances, special safety measures must be taken and the work must be supervised from a specialist.
– The PULVERISETTE 25 is not explosion protected and is not designed to cutt explosive materials.

- Do not remove the information signs.

NOTICE!

Immediately replace damaged or illegible information signs.

- Unauthorised alteration of the PULVERISETTE 25 will void Fritsch's declaration of conformity to European directives and void the guarantee.
- Only use the PULVERISETTE 25 when it is in proper working order, as intended and in a safety- and hazard-conscious manner adhering to the operating manual. In particular, immediately rectify any malfunctions that could pose a safety hazard.
- If, after reading the operating manual, there are still questions or problems, please do not hesitate to contact our specialised personnel.

2.6 Protective equipment

Protective equipment is to be used as intended and may not be disabled or removed.

All protective equipment is to be regularly checked for integrity and proper functioning.

The Power - cutting mill has a comprehensive safety system:

1. A safety switch monitors the closing of the closing lid during operation and prevents the Power - cutting mill from starting up when the grinding chamber is open.
2. There is a safety switch for monitoring the collecting vessel.

   During operation, it monitors the position of the collecting vessel for the material to be cut (3.5 l or 30 l container) and prevents the mill from starting up when the container has been removed.
3. When the standard funnel is used, it is also checked by a safety switch. If the funnel is not closed, start-up is prevented.

CAUTION!
Do not operate the device without a funnel!

All the switches fulfil the directives concerning personal protection.

4. Motor safety switch

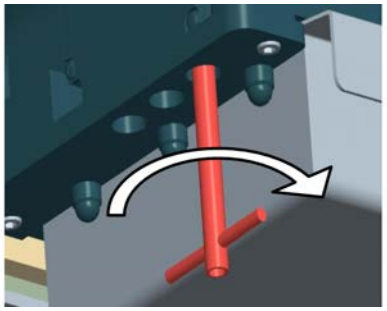
   If the cutting mill is overloaded, the motor switches off automatically! (See Chapter *'Overload of the cutting mill' on page 36*)

2.6.1 Opening the cutting mill without mains connection

DANGER!
The lock must only be released manually when the closing lid is closed.

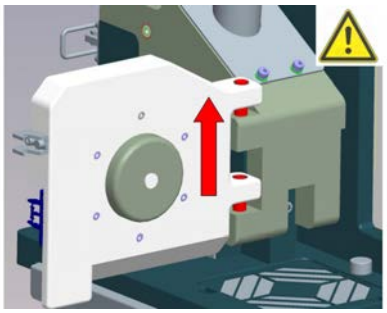
The latch clamp of the door must be locked!

1. Insert the supplied triangular key into the bore hole under the safety lock and turn it clockwise.
2. The closing lid can be opened after opening the latch clamp.

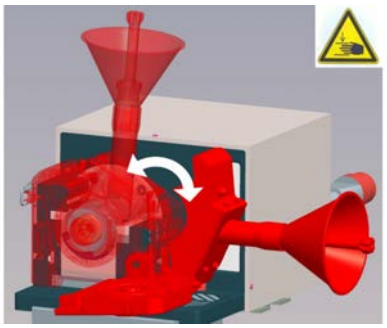


3. At this time, it is not possible to switch on the Power - cutting mill. To switch it on, the safety lock must be activated by turning the triangular key to the left, the closing lid must be closed and the latch clamp in locked position.

2.7 Hazardous points



- The closing lid can be lifted out of the hinges. When opening the upper part of the housing it is possible to leave the closing lid in the hinge. If this is the case, ensure that the closing lid does not lift out of the hinge when opening the upper part of the housing.

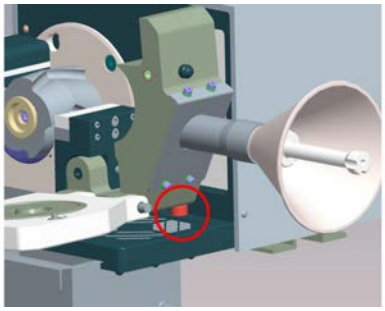


- When opening the upper part of the housing, there is an initial resistance.
- Make sure that the closing lid is fully open!

CAUTION!

Crushing hazard!

If the closing lid is not completely open, it can tip forward when the upper part of the housing is opened.

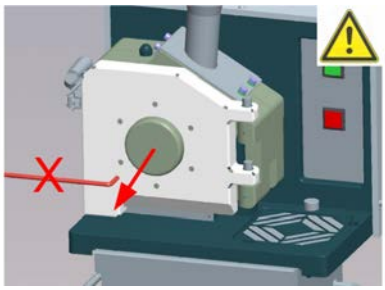


- When opening the upper part of the housing, slowly swivel it open until the upper part of the housing is resting on the rubber bumper - do not let it fall down heavily.

CAUTION!

Crushing hazard!

When closing the upper part of the housing: Close carefully!



- After checking if the rotor is turning freely (*'Checking if the rotor is turning freely' on page 29*), the required hexagon socket screw key must be removed immediately after the task is completed.

2.8 Electrical safety

2.8.1 General information

- The switch on the back is a main switch.
- Switch the main switch on the back of the Power - cutting mill to 0 (OFF) if the device is idle for a longer period of time (e.g. overnight).

2.8.2 Protection against restart

In the case of power failure during operation or after switching off with the control switch, the closing lid is locked. The lock is opened when power returns. However, for safety reasons the cutting mill does not restart.

2.8.3 Direction of rotation detection

A unit for detection of the direction of rotation is installed in devices with a three-phase motor:

If the STOP button lights up red after connecting to a three-phase power system and switching the main switch to I (ON), the direction of rotation must be corrected. To do this, two phases in the mains plug must be replaced. See *'Electrical connection' on page 20*.

2.8.4 Overload protection

- The motor protection switch switches off if overload occurs. *'Overload of the cutting mill' on page 36*. The STOP button lights up red.

3 Technical data

3.1 Dimensions

450 mm x 650 mm x 630 mm

(width x depth x height)

3.2 Weight

- Devices without funnel, cutting tools, sieve cassette, collecting vessel, and stand:
  75 kg (net)
- Devices with standard funnel for bulk solids, cutting tool from tungsten carbide, sieve cassette, collecting vessel, and stand:
  approx. 110 kg (net)
- Packed:
  approx. 140 kg (gross)

3.3 Operating noise

The noise level is approx. 78 dB (A) when idle. The value fluctuates strongly depending on the comminution material.

3.4 Voltage

- 400V / 3~

3.5 Current consumption

- 16A for 400V / 3~ motor
  (*'Electrical connection' on page 20*)
  Transient overvoltages in accordance with overvoltage category II are permitted.

3.6 Power consumption

- 3240 W for 400V / 3~ motor

3.7 Motor shaft power in accordance with VDE 0530, EN 60034

- 2.2 kW for 400V / 3~ motor

3.8 Electrical fuses

- Circuit breaker in device
- Micro-fuse in device
- Motor safety switch (*'Overload of the cutting mill' on page 36*)
- Direction of rotation detection in three-phase model (*'Electrical safety' on page 15*)

3.9 Material

Feed size

Depending on material and funnel, up to 120 x 85 mm. Harder material max. 20 mm.

Batchwise sample feeding!

Throughput

Depending on material property and sieve used, up to 85 l/h.

3.10 Final fineness

Achievable average final fineness depending on sieve insert, 1 - 10 mm.

3.11 Speed

300 - 360 rpm depending on voltage and frequency.

4 Installation

4.1 Transport

The device is delivered on a transport pallet with a wooden cover. We recommend using a forklift or pallet truck for transporting the packed device.

DANGER!
Do not step under the transport pallet during transport.

WARNING!
Improper lifting can lead to personal injury or property damage. The machine is only to be lifted with suitable equipment and by qualified personnel.

The guarantee excludes all claims for damage due to improper transport.

4.2 Unpacking

- Pull out the nails that fasten the cover to the transport pallet. The cover is the wooden box that has been placed over the transport pallet.
- Lift the cover off of the transport pallet.

CAUTION!
Crushing hazard!
Always lift with 2 persons.

- Compare the contents of the delivery with your order.

4.3 Setting up

CAUTION!
When lifting off, at least 2 persons are required!

- 4 screws connect the cutting mill to the transport pallet.
  Remove the 4 screws.
- Lift the cutting mill off the transport pallet.

4.4 Ambient conditions

WARNING!

Mains voltage!

– The device may only be operated indoors.
– The surrounding air may not carry any electrically conductive dust.
– Maximum relative humidity 80% for temperatures up to 31°C, linearly decreasing down to 50% relative humidity at 40°C.

- The room temperature has to stay between 5 - 40°C.
- Altitudes up to 2000 m
- Degree of pollution 2 according to IEC 664.

4.5 Electrical connection

Before establishing the connection, compare the voltage and current values stated on the type plate with the values of the mains system to be used.

CAUTION!

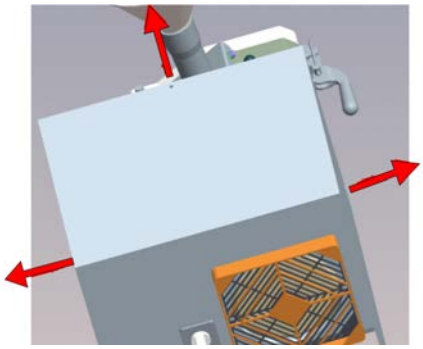
Ignoring the values on the type plate may result in damage to the electrical and mechanical components.

If the STOP button lights up red after connecting to a three-phase power system and switching the main switch to I (ON), the direction of rotation must be corrected. To do this, the two phases in the mains plug must be replaced.

4.5.1 Adapting to the mains

Changes to the connection voltage, i.e. from 230 V 3~ to 400 V 3~, and / or the connection line may only be made by a qualified technician.

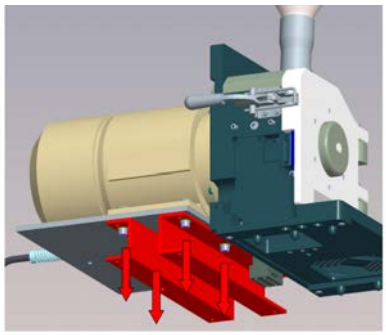
4.6 Fastening the Power Cutting Mill



Screw the cutting mill tightly to the stand provided (acc. to instructions) or to a stable mount (table...). The following must be observed in order to fasten the device:

- Unscrew the 3 screws fastening the motor cover.
- Lift the motor cover off carefully.

- Two U-profiles are mounted on the bottom of the device. Insert the 4 screws provided through the bore holes in the U-profiles and screw tightly to the stand or table. Other screws with the same diameter can also be used.



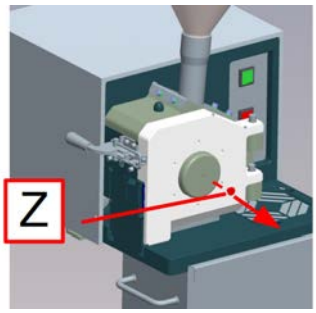
CAUTION!
Ensure that the device is safely fastened. Considerable lateral forces can occur!

NOTICE!
- Make sure that the cutting mill is easily accessible. On the right of the mill, there must be enough space to open the upper part of the housing together with the funnel.
- Make sure the ventilation grate on the back is not obstructed. **Risk of overheating!**

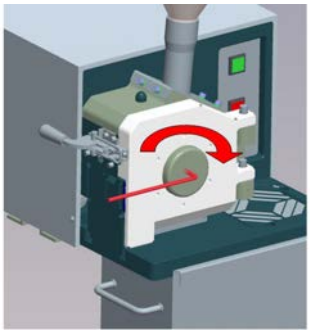
5 Initial start-up

5.1 Before switching on for the first time

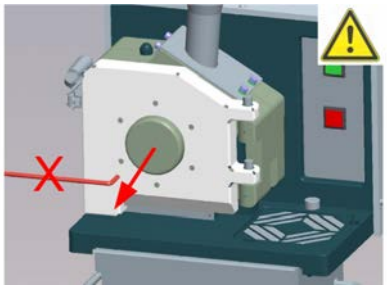
1. Set the main switch on the back of the device to 0 (OFF).
2. Connect the device to the mains with the mains plug.



3. Remove the cover cap (Z) of the central bore hole in the closing lid.



4. Insert the hexagon socket screw key provided through the central bore hole. Now turn the hexagon socket screw key to check if the rotor is turning freely.



5. **Remove the hexagon socket screw key again!**
6. If the rotor is not turning freely, proceed as described in *'Setting the gap width of the knives' on page 28*.

NOTICE!

This check must also be carried out every time the rotor, the fixed knives and the sieve cassette are changed!

5.2 Switching on

1. Check again that the cutting mill is firmly fastened.
2. Check that the funnel is firmly mounted and closed.
3. Slide in the collecting vessel.
4. Check if the latch clamp is closed.
5. Switch the control switch on the back of the device to I (ON) - the START button must light up green.

5.3 Function check

Switch on the device by pressing the START button. This closing lid is now locked.

→ The cutting mill starts up.

NOTICE!

Switch the device off immediately if there is an audible metal contact noise. This can happen if the fixed knives are set incorrectly. An indication of this could be shiny areas on the rotor, which show where the fixed knives must be readjusted. (See *'Inserting / changing the fixed knives' on page 26*).

5.4 Switching off

Press the STOP button to switch off the device. After waiting a few seconds the closing lid can be opened.

Switch off the main switch if the cutting mill is to be idle for a longer period of time (e.g. overnight).

CAUTION!

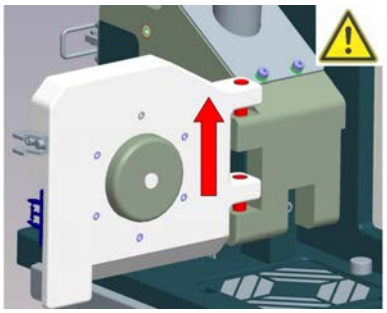
Never unlock the latch clamp during operation!

Risk of permanent damage to the rotor.

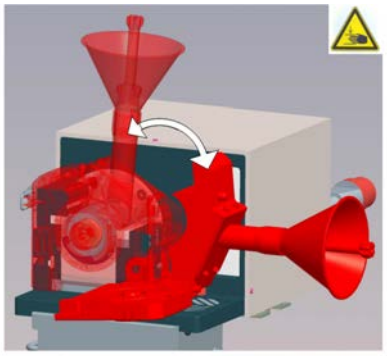
6 Using the device

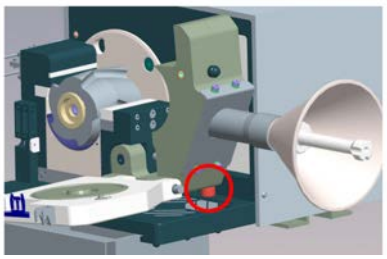
6.1 Preparing a comminution

6.1.1 Opening the cutting mill



1. Set the main switch on the back of the device to I (ON).
2. Unlock the latch clamp.
3. Open the closing lid. It is possible to lift the closing lid out of the hinge after opening. This is only necessary for tasks such as cleaning.





4. Make sure that the closing lid is fully open!

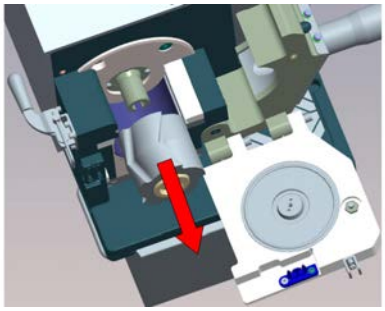
   Slowly swivel open the upper part of the housing until it is resting on the rubber bumper.

6.1.2 Inserting / changing a rotor

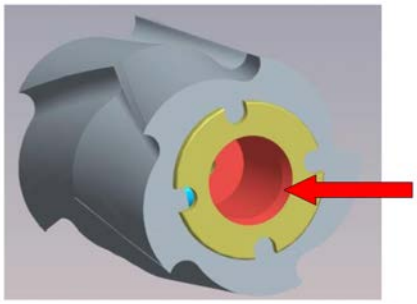
CAUTION!
Risk of injury!
Beware of the sharp edges of the rotor!

Wear safety gloves when changing the rotor!

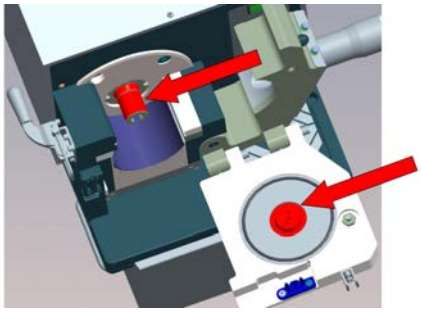
1. Open the cutting mill (see *'Opening the cutting mill' on page 24*).



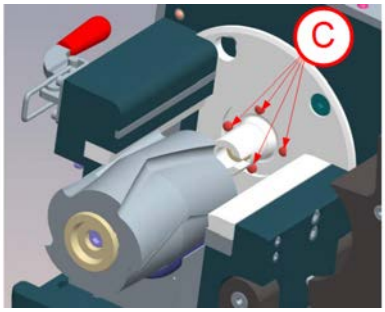
2. Pull the rotor forwards, wearing **safety gloves**. If the rotor jams somewhat, lever it out carefully.



3. Clean the cone-shaped rotor holders.



4. Clean both cone-shaped holders (cones) in the closing lid and on the holder.



5. Push the rotor onto the rotor holder. Turn it clockwise until it engages in the 4 actuating pins on the back.
6. Close the cutting mill (see *'Closing the cutting mill' on page 29*).
7. Afterwards:

NOTICE!

Check if the rotor (3) is turning freely (see *'Checking if the rotor is turning freely' on page 29*).

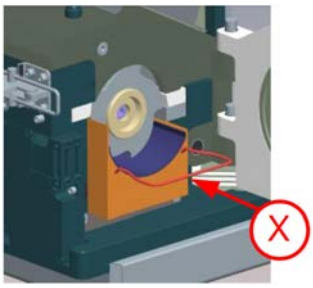
If this is not the case, proceed as described in .

This check must also be carried out every time the rotor (3) is changed!

6.1.3 Inserting / changing a sieve cassette

1. Open the cutting mill (see *'Opening the cutting mill' on page 24*).
2. Pull out the sieve cassette to the front. The rotor must not be removed.

   If necessary, use the pulling tool (X) 45.5550.10 to pull out the sieve cassette: Insert the pulling tool into the two holes of the sieve cassette past the bends of the pulling tool. While inserting the pulling tool, move it slightly up and down.

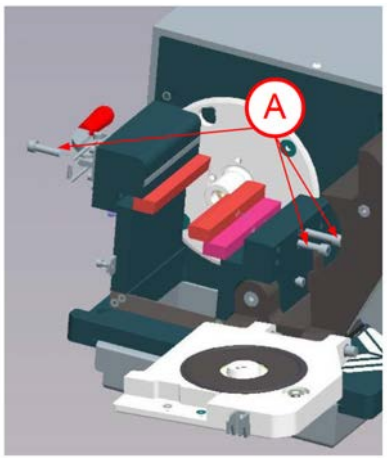


3. If the sieve cassette is jammed, remove the comminution material under the fixed knife on the left side of the housing with a screwdriver.
4. Before pushing in the sieve cassette, clean the cutting chamber thoroughly, so that everything can be closed tightly again.
5. Close the cutting mill (see *'Closing the cutting mill' on page 29*).

6.1.3.1 Selecting the sieve cassette

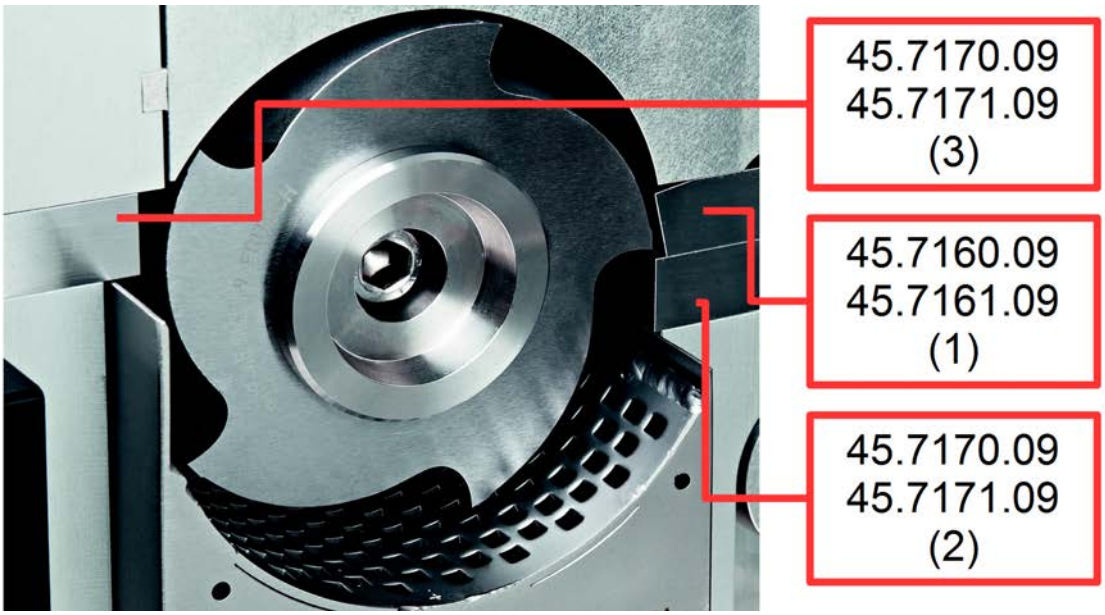
Coarse material should be roughly crushed with the coarse 2-4 mm sieve and comminuted in the second work step with a fine sieve to the desired final fineness.

6.1.4 Inserting / changing the fixed knives

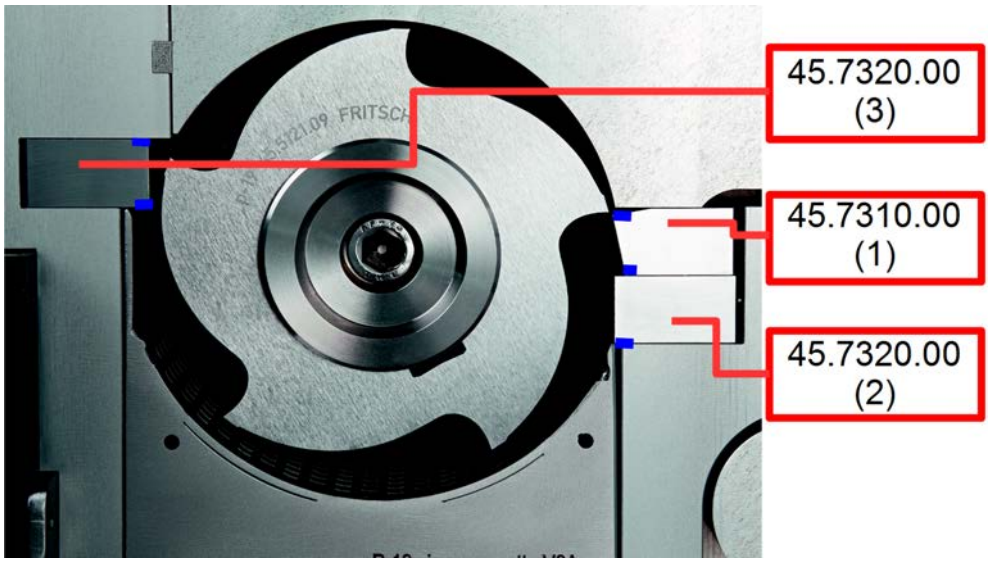


1. Open the cutting mill (see *'Opening the cutting mill' on page 24*)
2. When inserting or changing the fixed knives, the rotor and the sieve cassette must be removed (see *'Inserting / changing a rotor' on page 24* and *'Inserting / changing a sieve cassette' on page 26*).
3. Loosen the retaining screws (A) to change or remove the fixed knives.
4. When inserting, fasten the fixed knives with the retaining screw (A).
5. After mounting the rotor (see *'Inserting / changing a rotor' on page 24*) set the gap width of the knives (see *'Setting the gap width of the knives' on page 28*).

6.1.4.1 Installation position of the fixed knives



6.1.4.2 Installation position of the fixed knives with tungsten carbide cutting edge

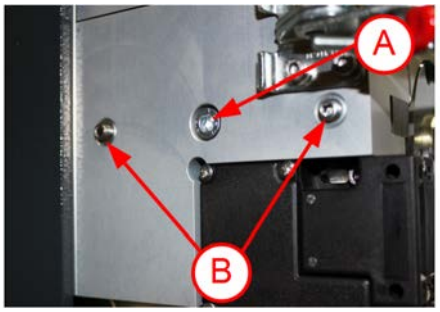


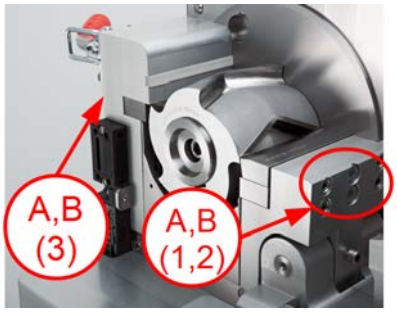
NOTICE!

Note the position of the Tungsten Carbide hard metal strips. These are marked BLUE in the image above.

6.1.5 Setting the gap width of the knives

The knife gap is set at the factory to approx. 0.2 mm.





A, B (3) Retaining screw (A) and threaded pins (B) for fixed knife (3)

A,B (1,2) Retaining screws (A) and threaded pins (B) for fixed knife (1,2)

1. Open the cutting mill (see *'Opening the cutting mill' on page 24*), but set the main switch on the back of the device to I (ON).
2. Loosen the middle retaining screws (A) on all 3 fixed knives and unscrew them slightly.
3. Turn the rotor so that the rotor knife and the fixed knife are exactly opposite each other.
4. Screw in the right and left threaded pins (B) beside the retaining screw (A) equally until the fixed knives come up against the rotor knives.
5. Then turn back evenly the threaded pins (B) a ¼ rotation and while doing so check the gap. After this, re-tighten the retaining screw (A).
6. Set all 3 fixed knives in this way.

   A knife gap of approx. 0.2 mm is then set using this method. This can be checked using a feeler gauge. (0.2 mm corresponds to approx. 2 sheets of printing paper, DIN A4 80 g)

> **NOTICE!**
> The fixed knives must run parallel to the rotor knives so that the cutting load is distributed evenly across the whole length.

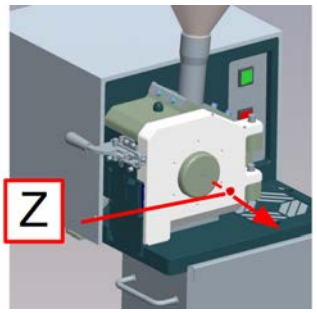
7. Insert the sieve cassette (see *'Inserting / changing a sieve cassette' on page 26*).
8. Close the cutting mill (see *'Closing the cutting mill' on page 29*).

> **NOTICE!**
> Check if the rotor is turning freely (see *'Checking if the rotor is turning freely' on page 29*).
>
> If this is not the case, proceed as described in *'Using the device' on page 24*.
>
> This check must also be carried out every time the rotor and the knife are changed!

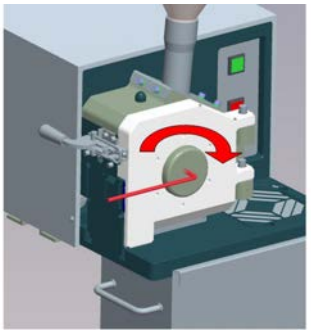
6.1.6 Closing the cutting mill

1. Before closing the cutting mill, clean the cutting chamber, the contact surfaces of the housing and, in particular, the locking surfaces of the lock.
2. Swivel the upper part of the housing slowly closed until it is resting on the lower part of the housing.
3. Close the closing lid.
4. Lock the latch clamp.
5. Set the main switch on the back of the device to 0 (OFF).

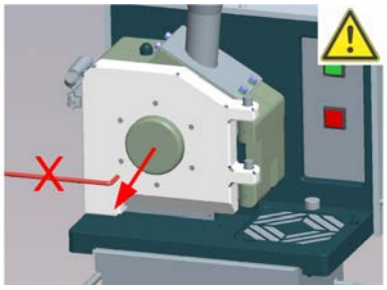
6.1.7 Checking if the rotor is turning freely



- To check if the rotor is turning freely, the closing lid must be closed. (See *'Setting the gap width of the knives' on page 28*).
- Remove the cover cap (Z) of the central bore hole in the closing lid.



- Guide the hexagon socket screw key provided through the central bore hole in the closing lid.
- Now turn the hexagon socket screw key to check if the rotor is turning freely.



- Remove the hexagon socket screw key again **immediately!**
- If the rotor is not turning freely, proceed as described in *'Setting the gap width of the knives' on page 28*.

NOTICE!
Perform this test each time the rotor or fixed knife is changed, and after a gap adjustment!

6.2 Comminution procedure with standard funnel

CAUTION!
Wear safety goggles for comminution using the standard funnel!

In the case of free-flowing material, particles could be ejected from the funnel.

1. Set the main switch on the back of the device to I (ON).
2. Close the cutting mill (see *'Closing the cutting mill' on page 29*).
3. Push in the collecting vessel.
4. Switch on the device → press the green Start button (see *'Switching on' on page 23*).
5. Add some comminution material.

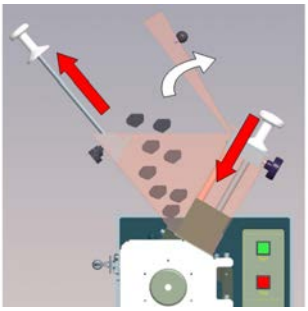
   ⇒An operating noise becomes audible.

   The sample quantity varies depending on the particle feed size, the hardness of the material and the sieve size. It is best to start with small quantities and increase them depending on the success of the comminution. If the quantity is too large, the cutting mill is in danger of becoming clogged.
6. When the operating noise becomes quieter, the comminution procedure is complete.

   ⇨ More comminution material can be added.

6.3 Comminution procedure with the protected funnel

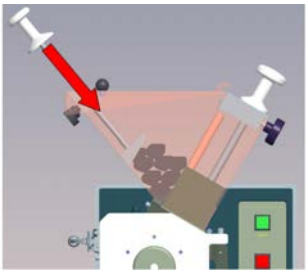
1. Switch the control switch on the back of the device to AUTO.
2. Close the cutting mill (see *'Closing the cutting mill' on page 29*).
3. Push in the collecting vessel.



4. Pull the sample pusher out fully.
5. Move the plunger into the lower position.
6. Open the funnel lid, add some comminution material and close the lid again.

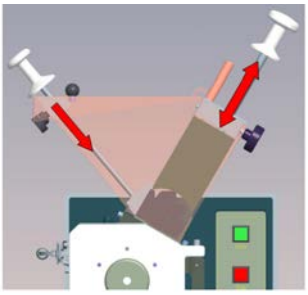
> *The sample quantity varies depending on the particle feed size, the hardness of the material and the sieve size. It is best to start with small quantities and increase them depending on the success of the comminution.*

7. Switch on the device → press the green Start button (see *'Switching on' on page 23*).



8. Move the sample pusher down towards the plunger until the comminution material is in front of the plunger.
9. Slowly pull the plunger upwards and move the sample pusher fully downwards until the comminution material falls into the cutting chamber.

   ⇨ A slight operating noise becomes audible.



10. Leave the sample pusher down and move the plunger downwards.

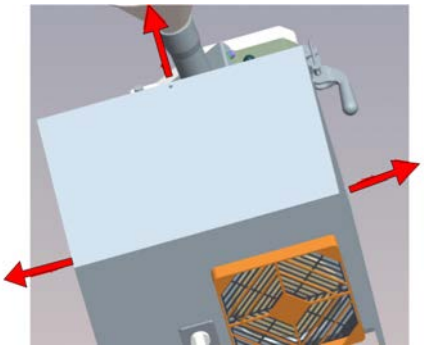
    ⇨ The operating noise becomes louder.
11. Make pumping movements with the plunger. These pumping movements draw in and press out air through the blower filter above the collecting vessel. This air feeds the comminution material through the sieve or lifts it off the sieve and back into the process.
12. When the operating noise becomes quieter, the cutting procedure is complete.

    ⇨ More comminution material can be added.

6.4 Converting from standard funnel to protected funnel

1. Close the cutting mill (see *'Closing the cutting mill' on page 29*).
2. Close the funnel lid.
3. Set the main switch on the back of the device to 0 (OFF).
4. Remove the mains plug.

Using the device

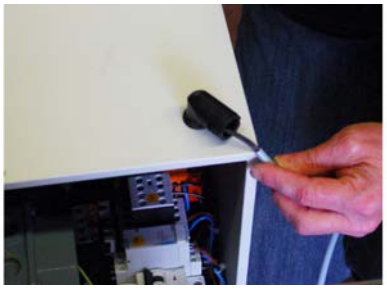


5. Unscrew the 3 screws fastening the motor cover.

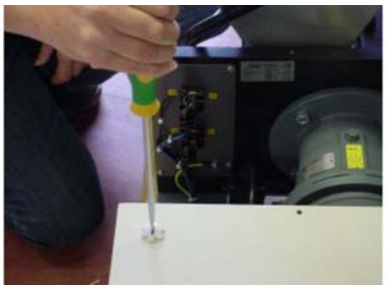
6. Carefully slide back the motor cover.

7. Disconnect the standard funnel at terminals 2 and 2.1.

8. Attach the cable bridge S4 to the terminals 2 and 2.1.

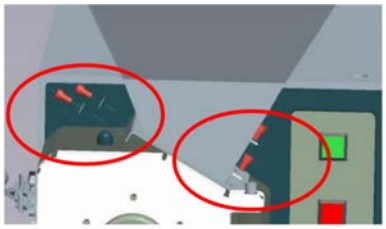


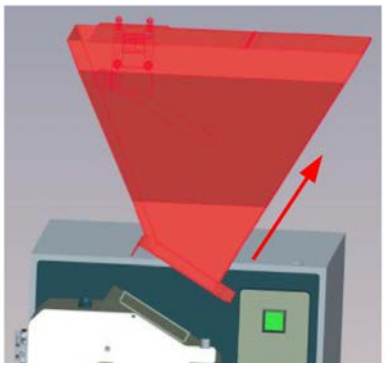
9. Remove the funnel cable from the angular screw joint by pressing down the clamping ring and pulling the black cable guide from the angle.



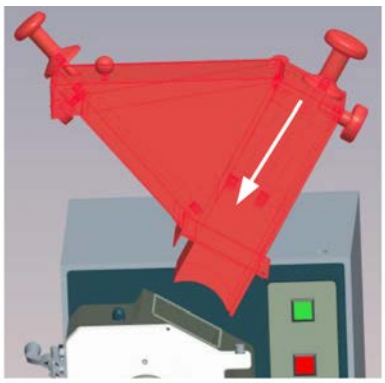
10. Screw the angular screw joint out of the motor cover and close the hole using a cover cap. This is screwed in with a screwdriver.

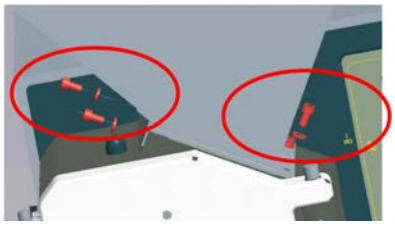
11. Fit the motor cover back on correctly and screw it tight.





12. Unscrew the four M6x12 cylinder head screws fastening the standard funnel to the upper part of the housing using a hexagon socket screw key and lift off the standard funnel.



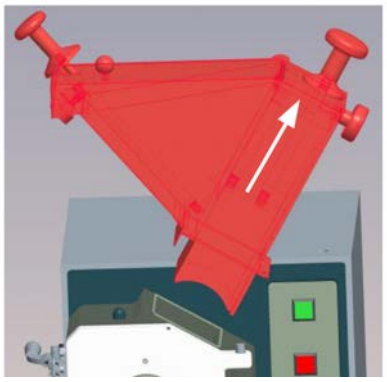


13. Insert the protected funnel and attach again with the four M6 x 12 cylinder head screws and their washers.
14. Connect the cutting mill to the mains again.
15. The device is ready for operation.

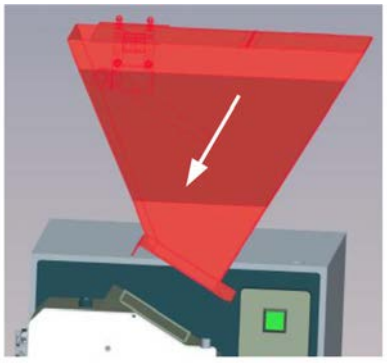
6.5 Converting from protected funnel to standard funnel

1. Close the cutting mill. (See *'Closing the cutting mill' on page 29*).
2. Close the funnel lid.
3. Set the main switch on the back of the device to 0 (OFF).
4. Remove the mains plug.

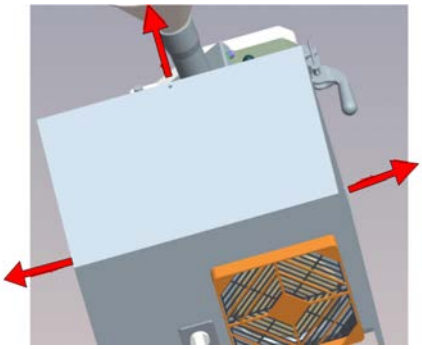
Using the device



5. Unscrew the four M6x12 cylinder head screws fastening the protected funnel to the upper part of the housing using a hexagon socket screw key and lift off the protected funnel.

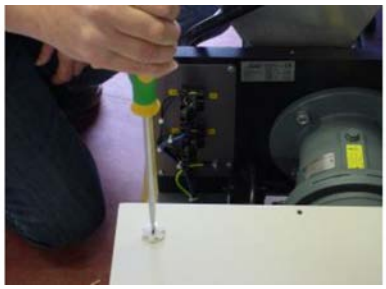


6. Insert the standard funnel and fasten it with the four M6 x 12 cylinder head screws and the washers.



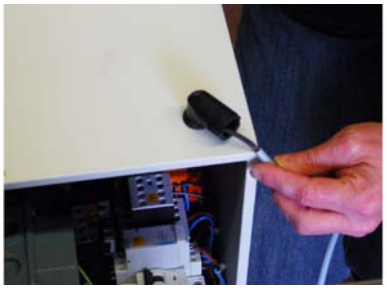
7. Unscrew the 3 screws fastening the motor cover.

8. Carefully slide back the motor cover.



9. Screw out the cover cap over the opening of the angular screw joint with a screwdriver.

10. Pull off the angular screw joint located at the funnel cable (push clamping ring downwards) and screw into the motor cover.



11. Afterwards, lead the cable of the funnel through the screw connection into the device's interior.

12. Proceed as follows if the cable is jammed (see circuit diagrams in the service manual):
    - Remove the cable bridge S4 at the terminals 2 and 2.1.
    - Connect the funnel cable to the released terminals 2.1 and 2.
13. Fit the motor cover back on and screw it tight.
14. Connect the cutting mill to the mains again.
15. Set the main switch on the back of the device to I (ON).
16. Check the functioning of the funnel:

    The cutting mill may only start when the funnel lid is closed; the mill has to switch off when the funnel lid is opened. (See *'Protective equipment' on page 13*).
17. The device is now ready for operation again.

6.6 Overload of the cutting mill

When filling and making downward movements with the plunger, the operating noise must be observed. The sound level is nearly identical to the load on the machine. You can clearly hear from the pitch when the mill reduces speed due to overload.

Pulling the plunger out on time reduces the load on the mill and protects the rotor, the fixed knives and the sieve cassette.

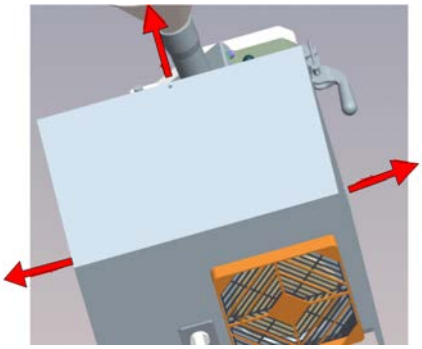
NOTICE!

If the cutting mill is overloaded, the motor protection switch switches the device off.

The red Stop button lights up to indicate overload.

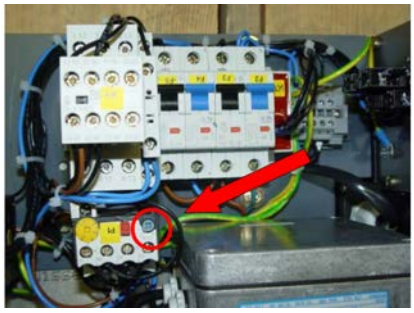
Then proceed as follows:

1. Set the main switch on the back of the device to 0 (OFF).
2. Disconnect the cutting mill from the mains (remove the mains plug from the socket).
3. Allow the device to cool down.



4. Unscrew the 3 screws fastening the motor cover.

5. Lift the motor cover off carefully.



6. Press the blue Reset switch. This must be set to "H".

7. Fit the motor cover back on and screw it tight.

8. Connect the cutting mill again to the mains.

9. Set the control switch on the back of the device to I (ON).

⇨ Start button lights up green. The device is ready for operation.

7 Cleaning

DANGER!

Mains voltage!

- Before beginning with cleaning work, disconnect the mains plug and protect the device against being unintentionally switched back on!
- Do not allow any liquids to flow into the device.
- Indicate cleaning work with warning signs.
- Put safety equipment back into operation after cleaning work.

7.1 Housing

The cutting mill can be wiped down with a damp cloth when it is switched off. Disconnect the mains plug from the electricity.

7.2 Cutting chamber

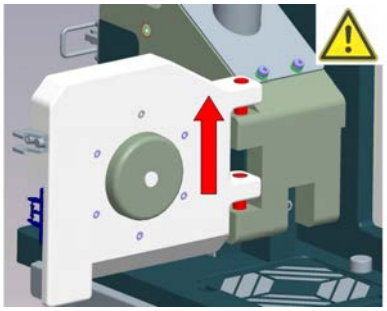
Clean the cutting chamber with a vacuum cleaner and brush, and with compressed air, if necessary.

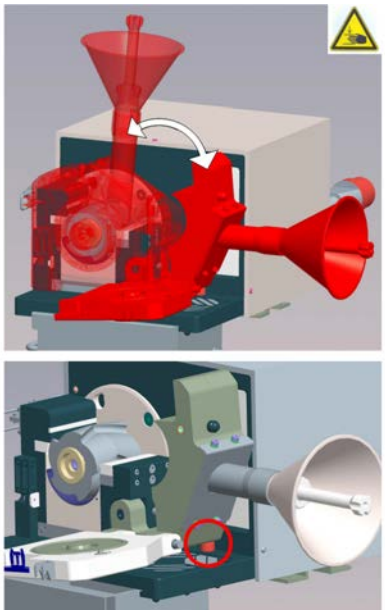
CAUTION!

Beware of dust exposure caused by cleaning with compressed air!

Wear protective goggles!

1. Set the main switch on the back of the device to I (ON).
2. Unlock the latch clamp.
3. Open the closing lid fully. For cleaning, this can be lifted carefully out of the hinge at an opening angle of 90°.





4. Slowly swivel open the upper part of the housing with the closing lid fully open or removed, until it is resting on the rubber bumper.
5. Clean the cutting chamber.

7.3 Funnel

CAUTION!

Beware of dust exposure caused by cleaning with compressed air!

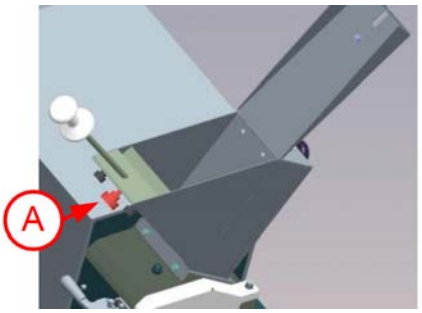
Wear protective goggles!

The funnel can be cleaned with a vacuum cleaner and brush, and with compressed air, if necessary.

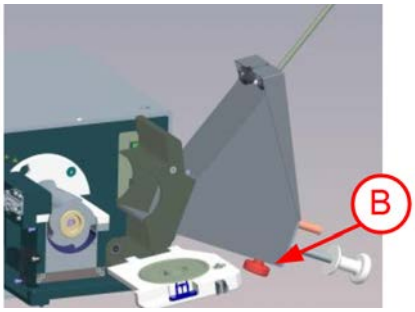
7.3.1 Standard funnel

1. With the cutting chamber open, vacuum out the funnel from below
2. Open the funnel lid and vacuum out the funnel from above.

7.3.2 Protected funnel



1. Set the main switch on the back of the device to 0 (OFF).
2. Pull the sample pusher out of the protected funnel until it stops and fasten it with knurled screw (A).
3. Open the funnel lid.
4. Clean the protected funnel from above.
5. Close the funnel lid.

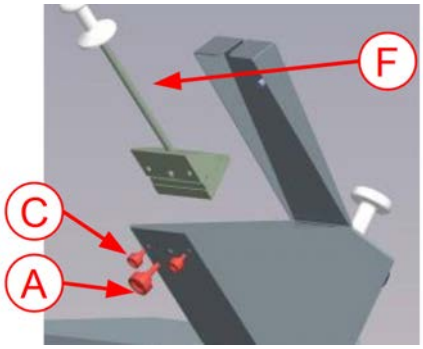


6. Pull the plunger out of the protected funnel until it stops and fasten it with knurled screw (B).
7. Open the cutting chamber as described above.
8. Clean the protected funnel from below.

If necessary!

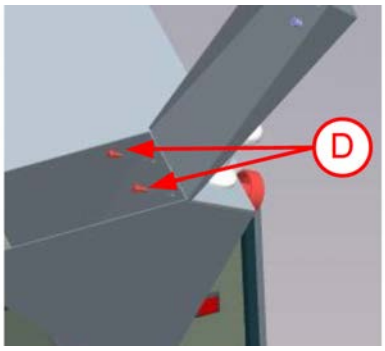
It is also possible to remove the plunger and the sample pusher for cleaning. To do so, set the main switch on the back of the device to 0 (OFF) and disconnect the mains plug from the electricity.

7.3.2.1 Removing sample pusher

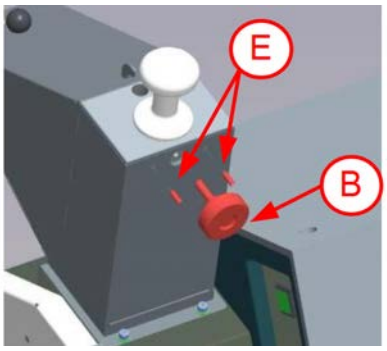


1. Open the funnel lid.
2. Unscrew the knurled screws (C) and (A).
3. The sample pusher (F) can be taken out.
4. Install in reverse order.

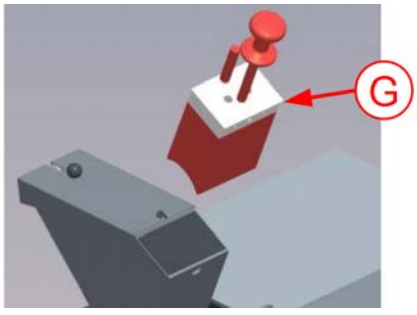
7.3.2.2 Removing the plunger



1. Open the funnel lid.
2. Unscrew the cross-head screws (D) with a screwdriver.
3. Close the funnel lid.



4. Unscrew the Torx screws (E) with a screwdriver.
5. Unscrew the knurled screw (B).



6. The plunger (G) can now be taken out.
7. Install in reverse order.

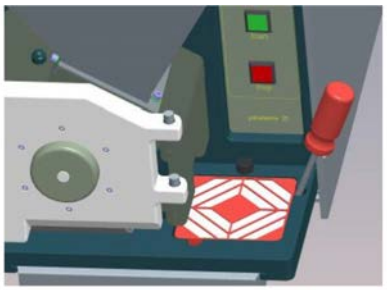
7.4 Collecting vessel

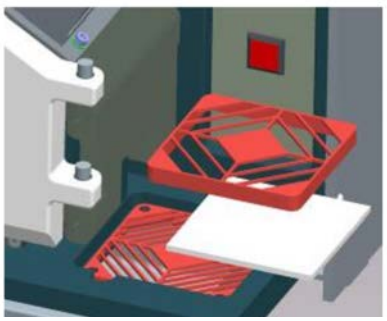
Pull out the collecting vessel and clean it. It can be vacuumed or wiped down with a damp cloth.

NOTICE!
Close the cutting mill after cleaning and check for proper functioning. See *'Initial start-up' on page 22*.

NOTICE!
Make sure that the parts sit firmly when assembling.

7.5 Cleaning the filter foam mat





1. Vacuum the filter foam mat with the vacuum cleaner.
2. Subsequently wash it out with water. If necessary, you could use a tenside for cleaning.
3. Allow the foam mat to air-dry!

8 Maintenance

DANGER!

Mains voltage

- Before beginning with maintenance work, unplug the mains plug and protect the device against being unintentionally switched back on again!
- Indicate maintenance work with warning signs.
- Maintenance work may only be performed by specialised personnel.
- Put safety equipment back into operation after maintenance or repair work

NOTICE!

Observe the sharpness of the fixed knife. If the fixed knife is blunt, the motor may burn out!

Fritsch GmbH cannot uphold the guarantee if this is not observed!

We recommend keeping a safety logbook ↬ Chapter 13 ‘Safety logbook’ on page 53, where all work (maintenance, repairs.....) performed on the device is entered.

The most important element of maintenance is regular cleaning:

Maintenance

Functional part	Function / Type	Inspection	Maintenance interval
Exhaust filter	Filtering exhaust air	Clean exhaust filter. To do this, lever out the filter holder (A) with a screwdriver or similar. Beat the filter foam mat (B). Clean using compressed air or vacuum cleaner. Replace the filter foam mat (B) if it is very heavily soiled. Article number: 90.0740.16 Filter foam mat.	Before each use
Safety lock	Locking the closing lid	Is the closing lid kept closed when the main switch is at 0 (OFF)? If NOT, the safety lock is defective. Disconnect the device from the mains immediately. Replace the safety lock.	Before each use
Closing lid safety switch	Protecting the lower opening of the cutting chamber	Is the cutting mill starting up without collecting vessel? If YES, the safety switch is defective. Disconnect the device from the mains immediately. Replace the safety switch.	Before each use
Funnel opening safety switch	Securing the funnel opening	Is the cutting mill running with the lid of the standard funnel open? If YES, the safety switch is defective. Disconnect the device from the mains immediately. Replace the safety switch.	Before each use
START button	Indicating readiness for operation	Does the START button light up green if the main switch is at I (ON)? If not, see *'Checklist for troubleshooting' on page 46*.	Before each use
Rotor	Comminuting material	Is the rotor still sharp? If not, resharpen or replace depending on wear.	Before each use
Fixed knives	Comminuting material	Are the fixed knives sharp? Maintenance: Turn around or resharpen.	Before each use

Functional part	Function / Type	Inspection	Maintenance interval
Cutting gap	Comminuting material	Measure gap width. For setting see ↳ *'Setting the gap width of the knives' on page 28*.	Whenever rotor and fixed knives are changed
Cones	Centring rotor	Check cones for cleanliness and grooves. See ↳ *'Inserting / changing a rotor' on page 24*.	Whenever rotor is changed

8.1 Removing and installing the cutting knives

Depending on the material to be cut and the duration of use, the fixed knives have to be resharpened or replaced. Fixed knives 2 and 3 can be turned once; after this, they must be resharpened or replaced. For installation or removal, observe Chapter ↳ *'Inserting / changing the fixed knives' on page 26*.

9 Repairs

DANGER!

Mains voltage!

- Before beginning with repair work, unplug the mains plug and protect the device against being unintentionally switched back on.
- Indicate repair work with warning signs.
- Repair work may only be performed by specialised personnel.
- Put safety equipment back into operation after maintenance work.

9.1 Checklist for troubleshooting

Fault description	Cause	Remedy
Start button does not light up green	No mains connection	Plug in mains plug
	Main switch at 0 (OFF)	Switch main switch to I (ON).
	Incorrect direction of rotation	Reverse two phases (see *'Electrical connection' on page 20*)
	Socket fuse is faulty	Check socket fuse
	Device fuse blown	Remove the housing and replace the fuse
START button has been pressed but mill does not start up	Closing lid not closed properly	Clean contact surface, close closing lid
	Collecting vessel not inserted correctly	Insert collecting vessel correctly until the safety switch clicks in
	Lid of standard funnel not closed correctly	Close funnel lid correctly (until the safety switch clicks in)
Mill stops, STOP button lights up red	Motor safety switch has triggered	Motor safety switch (see *'Overload of the cutting mill' on page 36*)
	Incorrect direction of rotation	Swap two phases in the mains plug (see *'Electrical connection' on page 20*)
	Too much comminution material	Reduce feed quantity
Comminution material is escaping	Material is extremely fine	
Runs unevenly with strong vibrations	Rotor imbalance	Cones soiled (see *'Inserting / changing a rotor' on page 24*)

Fault description	Cause	Remedy
	Bearing in closing lid defective	Replace bearing
	Parts of rotor broken off	Replace rotor (see *'Inserting / changing a rotor' on page 24*)

10 Disposal

It is hereby confirmed that FRITSCH has implemented the directive 2002/95/EC of the European Parliament and Council from 27th January 2003 for the limitation of the use of certain dangerous substances in electrical and electronic devices.

FRITSCH has registered the following categories according to the German electrical and electronic equipment act, section 6, paragraph 1, clause 1 and section 17, paragraphs 1 and 2:

Mills and devices for the preparation of samples have been registered under category 6 for electrical and electronic tools (except for large stationary industrial tools).

Analytical devices have been registered under category 9, monitoring and control instruments.

It has been accepted that FRITSCH is operating only in the business-to-business area. The German registration number for FRITSCH is WEEE reg. no. DE 60198769

FRITSCH WEEE coverage

Since the registration of FRITSCH is classified for bilateral transactions, no legal recycling or disposal process is described. FRITSCH is not obliged to take back used FRITSCH devices.

FRITSCH declares it is prepared to take back used FRITSCH devices for recycling or disposal free of charge whenever a new device is purchased. The used FRITSCH device must be delivered free of charge to a FRITSCH establishment.

In all other cases FRITSCH takes back used FRITSCH devices for recycling or disposal only against payment.

11 Guarantee terms

Guarantee period

As manufacturer, FRITSCH GmbH provides – above and beyond any guarantee claims against the seller – a guaranty valid for the duration of two years from the date of issue of the guarantee certificate supplied with the device.

Within this guarantee period, we shall remedy all deficiencies due to material or manufacturing defects free of charge. Rectification may take the form of either repair or replacement of the device, at our sole discretion. The guarantee may be redeemed in all countries in which this FRITSCH device is sold with our authorisation.

Conditions for claims against the guarantee

This guarantee is subject to the condition that the device is operated according to the instructions for use / operating manual and its intended use.

Claims against the guarantee must include presentation of the original receipt, stating the date of purchase and name of the dealer, together with the complete device type and serial number.

For this guarantee to take effect, the answer card entitled "Securing of Guarantee" (enclosed with the device) must be properly filled out and despatched without delay after receipt of the device and be received by us within three weeks or alternatively, *online registration* must be carried out with the above-mentioned information.

Reasons for loss of the guarantee

The guarantee will not be granted in cases where:

- Damage has arisen due to normal wear and tear, especially for wear parts, such as: Crushing jaws, support walls, grinding bowls, grinding balls, sieve plates, brush strips, grinding sets, grinding disks, rotors, sieve rings, pin inserts, conversion kits, sieve inserts, bottom sieves, grinding inserts, cutting tools, sieve cassettes, sieve and measuring cell glasses.
- Repairs, adaptations or modifications were made to the device by unauthorized persons or companies.
- The device was not used in a laboratory environment and/or has been used in continuous operation.
- Damage is present due to external factors (lightning, water, fire or similar) or improper handling.
- Damage is present that only insubstantially affects the value or proper functioning of the device.
- The device type or serial number on the device has been changed, deleted, removed or in any other way rendered illegible
- The above-mentioned documents have been changed in any way or rendered illegible.

Guarantee terms

Costs not covered by the guarantee

This guarantee excludes any costs for transport, packaging or travel that accrue in the event the product must be sent to us or in the event that one of our specialist technicians is required to come to your site. Any servicing done by persons not authorised by us and any use of parts that are not original FRITSCH accessories and spare parts will void the guarantee.

Further information about the guarantee

The guarantee period will neither extend nor will a new period of guarantee begin in the event that a claim is placed against the guarantee.

Please provide a detailed description of the type of error or the complaint. If no error description is enclosed, we shall interpret the shipment as an assignment to remedy all recognisable errors or faults, including those not covered by the guarantee. Errors or faults not covered by the guarantee shall in this case be rectified at cost.

We recommend reading the operating manual before contacting us or your dealer, in order to avoid unnecessary inconvenience.

Ownership of defective parts is transferred to us with the delivery of the replacement part; the defective part shall be returned to us at buyer's expense.

NOTICE!

Please note that in the event that the device must be returned, the device must be shipped in the original Fritsch packaging. Fritsch GmbH denies all liability for any damage due to improper packaging (packaging not from Fritsch).

Any enquiries must include a reference to the serial number imprinted on the type plate.

12 Exclusion of liability

Before using the product, be sure to have read and understood this operating manual.

The use of the product requires technical knowledge; only commercial use is permitted.

The product may be used exclusively within the scope of applications set down in this operating manual and within the framework of guidelines put forth in this operating manual and must be subject to regular maintenance. In case of non-compliance, improper use or improper maintenance, the customer assumes full liability for the functional capability of the product and for damage or injury arising from violating these obligations.

The contents of this operating manual are subject in entirety to copyright law. This operating manual and its contents may not be copied, further distributed or stored in any form, in part or in whole, without the prior written consent of Fritsch.

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FRITSCH GMBH expressly reserves the right to modify and/or update this operating manual without prior notice. The same applies to modifications and improvements to the products described in this operating manual. It is the responsibility of the user to ensure that they have the current version of this operating manual. For more information, please contact your local FRITSCH GMBH distributor or Fritsch GmbH, Industriestr. 8, D-55473 Idar-Oberstein.

Not all parts shown here are necessarily installed in the product. The buyer is not entitled to delivery of these parts. If interested, please contact your local FRITSCH GMBH distributor or Fritsch GmbH, Industriestr. 8, D-55743 Idar-Oberstein.

FRITSCH GMBH takes the greatest care to ensure that the quality, reliability and safety of your products are continuously improved and adapted to the state of the art. The supplied products as well as this operating manual conform to the current state of the art when they leave the sphere of influence of FRITSCH GMBH.

By using the product the customer agrees with this and recognizes that defects, malfunctions or errors cannot be completely excluded. To prevent risk of damage to persons or property or of other direct or indirect damage, resulting from this or other causes, the customer must implement sufficient and comprehensive safety measures for working with the product.

Exclusion of liability

Fritsch GmbH excludes any liability, warranty, or other obligation to compensate for damages, regardless of whether this liability, warranty, or other obligation is explicit or implicit, contractual or arising from unlawful acts or prescribed contractually, by law, or otherwise. In no event shall the buyer be entitled to any compensation from Fritsch GmbH for any special, direct, indirect, coincidental or consequential damage, including but not limited to lost profits, lost savings, lost sales or financial loss of any kind or for compensation of third parties, for downtimes, for lost goodwill, for damage to or replacement of equipment and property, for costs or restoration of materials or goods related to the product or the use of our products, for other damage or injury to persons (including fatal injuries) or similar. The above exclusion of liability is limited by mandatory liability as prescribed by laws or jurisprudence. Liability for negligence is excluded in all cases.

No permission is given expressly, implicitly or otherwise for the use of patents, brands or other copyrights. We also assume no liability for copyright infringements or infringements of the rights of third parties arising from the use of this product.

Neither compliance with this operating manual nor the conditions and methods used during installation, operation, use and maintenance of the product can be monitored by Fritsch GmbH. Improper execution of the installation can result in property damage and thus endanger persons. Therefore, we assume absolutely no responsibility or liability for loss, damage or costs that result from errors at installation, improper operation or improper use or improper maintenance or are in any way connected to these.

13 Safety logbook

Date	Maintenance / Repair	Name	Signature

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Fritsch GmbH
Milling and Sizing
Industriestraße 8
D - 55743 Idar-Oberstein
Telephone: +49 (0)6784/ 70-0
Fax: +49 (0)6784/ 70-11
Email: info@fritsch.de
Internet: www.fritsch.de